
Space Weather Forecast

Issued on Monday, 21 March 2022 at 00:49 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: No significant activity currently expected.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with occasional Common-class flares, the largest emanating from a now decayed region in the northeast quadrant at 20/0745 UTC, which also produced a CME (coronal mass ejection). There are currently two numbered sunspot regions on the visible disc. A small and simple bi-polar group in the southeast quadrant, with another small, simple bi-polar group in the northeast.

The CME associated with the largest common-class flare looks directed north and east of the Sun-Earth line, so an Earth directed component seems unlikely. However, modelling results are still pending at the time of writing. No other Earth-directed CMEs were observed on available imagery.

Solar Wind / Geomagnetic Activity: Solar winds remained at background levels. The Interplanetary Magnetic Field (IMF) was weak to moderate, with the north-south component only having short southward pointing periods. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to continue predominantly Very Low or Low through the period, given the current sunspot configuration.

Solar Wind / Geomagnetic Activity: Background solar winds are likely to continue in the short-term, however there may still be some limited coronal hole enhancement during the next 24 hours, although confidence is low. By day 4 (24 March) another small, coronal hole may become geoeffective, perhaps with a higher chance of some faster solar wind. The CME associated with the common-class flare on 20th looks directed largely north and east of the Sun-Earth line, so an Earth directed component seems unlikely. However, modelling results are still pending at the time of writing.

Geomagnetic activity is expected to be mostly Quiet (Kp 0-2), with occasional Unsettled periods (Kp 3), these most likely to be associated with any coronal hole interaction on days 1 and 4. This would also carry a slight chance for an isolated Active (Kp 4) interval.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background levels with no solar radiation storms currently expected.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	5	1	1	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	5	1	1	1
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)